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IN THE CLAIMS:

98 (currently amended). A composition for chemical-mechanical polishing, comprising:

at least one oxidizing agent;

at least one abrasive particle; and

~~a~~ catalyst comprising a source of an ion of a metal, wherein the metal is selected from a group consisting of cobalt, copper, iron, nickel, silver, and any combination thereof ~~other than a metal of Group 4(b), Group 5(b), or Group 6(b)~~, there being a physical connection between the catalyst and at least a portion of the abrasive particle.

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99 (previously presented). The composition of claim 98, wherein the oxidizing agent comprises a per compound.

100 (previously presented). The composition of claim 98, wherein the oxidizing agent comprises ozone.

101 (currently amended). The composition of claim 99 ~~98~~, wherein the composition further comprises an oxidizing agent ~~comprises an agent~~ selected from a group consisting of a metal salt, a metal complex, and any combination thereof.

102 (previously presented). The composition of claim 98, wherein the oxidizing agent is selected from a group consisting of hydroxylamine, a salt of hydroxylamine, and any combination thereof.

103 (previously presented). The composition of claim 98, wherein the oxidizing agent is in an amount of from about 0.01 to about 30 weight percent relative to the composition.

104 (previously presented). The composition of claim 98, wherein the oxidizing agent is in an amount of from about 0.01 to about 10 weight percent relative to the composition.

105 (previously presented). The composition of claim 98, wherein the oxidizing agent is in an amount of from about 0.01 to about 6 weight percent relative to the composition.

106 (previously presented). The composition of claim 98, wherein the at least one abrasive particle comprises a metal oxide.

107 (previously presented). The composition of claim 98, wherein the at least one abrasive particle comprises a material selected from a group consisting of alumina, ceria, germania, silica, spinel, titania, an oxide of tungsten, zirconia, and any combination thereof.

108 (previously presented). The composition of claim 98, wherein the at least one abrasive particle comprises silica.

109 (currently amended). The composition of claim 98, wherein the at least one abrasive particle comprises a metal oxide produced by a process selected from a group consisting of a sol-gel process, ~~a hydrothermal process, a plasma process, a fuming process~~, a precipitation process, and any combination thereof.

110 (previously presented). The composition of claim 98, wherein the at least one abrasive particle comprises a resinous particle.

111 (previously presented). The composition of claim 98, wherein the at least one abrasive particle comprises a material selected from a group consisting of a polyacrylic acid, a polymethylacrylic acid, a polymelamine, a particle of an ion exchange resin, and any combination thereof.

112 (previously presented). The composition of claim 98, wherein the at least one abrasive particle comprises a plastic particle.

113 (previously presented). The composition of claim 98, wherein the at least one abrasive particle comprises a material selected from a group consisting of a polyacrylic acid, a polymethylacrylic acid, a polyvinyl alcohol, and any combination thereof.

114 (previously presented). The composition of claim 98, wherein an effective diameter of the at least one abrasive particle is from about 30 to about 170 nanometers.

115 (currently amended). The composition of claim 98, wherein the at least one abrasive particle and the catalyst in physical connection therewith together are in an amount of from about 0.01 to about 6 ~~50~~ weight percent relative to the composition.

116 (previously presented). The composition of claim 98, wherein the at least one abrasive particle and the catalyst in physical connection therewith together are in an amount of from about 0.01 to about 20 weight percent relative to the composition.

117 (previously presented). The composition of claim 98, wherein the at least one abrasive particle and the catalyst in physical connection therewith together are in an amount of from about 0.01 to about 10 weight percent relative to the composition.

118 (previously presented). The composition of claim 98, wherein the source is in a form selected from a group consisting of an acetate, a nitrate, a halide, a perchlorate, and any combination thereof.

119 (currently amended). The composition of claim 201 ~~98~~, where the metal has a standard oxidation potential of from about -0..52 to about -0.25 eV.

120 (currently amended). The composition of claim 201 ~~98~~, where the metal has a standard oxidation potential of from about -0.5 to about -0.4 eV.

121 (currently amended). The composition of claim 98, wherein the metal consists essentially of iron, copper, or combination thereof ~~is selected from a group consisting of metals in Group 1(b) and Group 8~~.

122 (currently amended). The composition of claim 98, wherein the metal ~~is selected from a group consisting of~~ comprises cobalt, ~~copper, iron,~~ nickel, ~~silver,~~ and any combination thereof.

123 (currently amended). The composition of claim 98, wherein the metal comprises silver ~~is selected from a group consisting of copper, iron, nickel, and any combination thereof~~.

124 (previously presented). The composition of claim 98, wherein the metal is iron and the at least one abrasive particle comprises silica.

125 (previously presented). The composition of claim 98, wherein the catalyst is in physical connection with from about 5 to about 100 percent of the surface of the at least one abrasive particle.

126 (previously presented). The composition of claim 98, wherein the catalyst is in physical connection with from about 5 to about 80 percent of the surface of the at least one abrasive particle.

127 (previously presented). The composition of claim 98, wherein the catalyst is in physical connection with from about 25 to about 50 percent of the surface of the at least one abrasive particle.

128 (previously presented). The composition of claim 98, wherein the catalyst is substantially insoluble in the composition.

129 (canceled).

130 (previously presented). The composition of claim 98, wherein the catalyst and the oxidizing agent are capable of interacting to generate free radicals.

131 (previously presented). The composition of claim 98, wherein the free radicals comprises hydroxyl free radicals.

132 (previously presented). The composition of claim 98, further comprising at least one other abrasive that is free of a physical connection with catalyst.

134 (previously presented). The composition of claim 98, wherein the other abrasive is in an amount of from about 0.01 to about 20 weight percent relative to the composition.

135 (previously presented). The composition of claim 98, wherein the other abrasive is in an amount of from about 0.01 to about 10 weight percent relative to the composition.

136 (previously presented). The composition of claim 98, further comprising an additive selected from a group consisting of a polish-enhancement agent, a stabilization agent, a surfactant, a dispersion agent, a pH-adjusting agent, and any combination thereof.

137 (previously presented). The composition of claim 136, wherein the additive is present in an amount of from about 0.001 to about 2 weight percent relative to the composition.

138 (previously presented). The composition of claim 98, wherein a pH of the composition is from about 2 to about 11.

139 (previously presented). The composition of claim 98, wherein a pH of the composition is from about 2 to about 8.

140 (previously presented). The composition of claim 98, the composition sufficient for chemical-mechanical polishing of a substrate surface having a feature thereon comprising a first material selected from a group consisting of aluminum, copper, titanium, tungsten, any alloy thereof, and any combination thereof.

141 (previously presented). The composition of claim 140, the composition sufficient for chemical-mechanical polishing of the substrate surface comprising a second material adjacent the feature, the second material selected from a group consisting of tantalum, tantalum nitride, titanium, titanium nitride, titanium tungsten, tungsten, and any combination thereof.

142 (previously presented). A composition for chemical-mechanical polishing, comprising:

at least one oxidizing agent;

at least one abrasive particle; and

a catalyst comprising a source of an ion of a metal, wherein the metal is selected from a group consisting of copper, iron, nickel, silver, and any combination thereof, there being a physical connection between the catalyst and at least a portion of the abrasive particle.

143 (currently amended). A method of polishing a substrate surface having at least one feature thereon comprising a metal, comprising:

providing the composition of ~~any one of claims~~ claim 98 ~~and 142~~; and

chemical-mechanical polishing the feature with the composition.

144 (previously presented). The method of claim 143, wherein said providing comprises combining the at least one abrasive particle, there being a physical connection between the catalyst and at least a portion of the abrasive particle, with a prepared composition, the prepared composition comprising the oxidizing agent and being free of a catalyst-associated abrasive.

145 (previously presented). The method of claim 143, wherein the metal of the feature is selected from a group consisting of aluminum, copper, titanium, tungsten, any alloy thereof, and any combination thereof.

146 (previously presented). The method of claim 143, wherein the feature is adjacent a material selected from a group consisting of tantalum, tantalum nitride, titanium, titanium nitride, titanium tungsten, tungsten, and any combination thereof.

147 (previously presented). The method of claim 143, wherein the chemical-mechanical polishing comprises applying a pressure of from about 1 to about 6 pounds per square inch to the feature.

148. (previously presented). The substrate produced by the method of claim 143, the substrate comprising the substrate surface, wherein the metal of the feature is selected from a group consisting of aluminum, copper, titanium, tungsten, any alloy thereof, and any combination thereof.

149 (previously presented). The substrate of claim 148, wherein the feature is adjacent a material selected from a group consisting of tantalum, tantalum nitride, titanium, titanium nitride, titanium tungsten, tungsten, and any combination thereof.

150 (canceled).

151 (previously presented). The substrate of claim 148, the substrate surface having from about zero to about 12 percent within-wafer nonuniformity.

152 (previously presented). The substrate of claim 148, wherein any microscratch on the substrate surface produced during the chemical-mechanical polishing is less than about 10 Angstroms.

153 (previously presented). A composition for chemical-mechanical polishing, comprising:

at least one oxidizing agent;

at least one abrasive particle; and

a catalyst comprising a material selected from a group consisting of a metal acetate, a metal nitrate, a metal halide, a metal perchlorate, and any combination thereof, the metal thereof being selected from a group consisting of copper, nickel, iron, silver, and any combination thereof, there being a physical connection between the catalyst and at least a portion of the abrasive particle.

154 (canceled).

155 (previously presented). A composition for chemical-mechanical polishing, comprising:

at least one oxidizing agent;

at least one abrasive particle; and

a catalyst comprising a source of an ion of a metal, wherein the metal is selected from a group consisting of copper, nickel, iron, silver, and any combination thereof, wherein there is a physical connection between the catalyst and at least a portion of the abrasive particle, and the catalyst and the oxidizing agent are capable of interacting to generate free radicals.

156 (previously presented). The composition of claim 155, wherein the free radicals comprise hydroxyl free radicals.

157 (previously presented). The composition of any of claims 153 and 155, wherein the oxidizing agent comprises a per compound.

158 (previously presented). The composition of any of claims 153 and 155, wherein the oxidizing agent comprises ozone.

159 (previously presented). The composition of any of claims 153 and 155, wherein the oxidizing agent comprises an agent selected from a group consisting of a metal salt, a metal complex, and any combination thereof.

160 (previously presented). The composition of any of claims 153 and 155, wherein the oxidizing agent is selected from a group consisting of hydroxylamine, a salt of hydroxylamine, and any combination thereof.

161 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, wherein the oxidizing agent is in an amount of from about 0.01 to about 6 weight percent relative to the composition.

162 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, wherein the at least one abrasive particle comprises a material selected from a group consisting of alumina, ceria, germania, silica, spinel, titania, an oxide of tungsten, zirconia, and any combination thereof.

163 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, wherein the at least one abrasive comprises silica.

164 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, wherein the at least one abrasive particle comprises a material selected from a group consisting of a polyacrylic acid, a polymethalacrylic acid, a polyvinyl alcohol, a polymelamine, a particle of an ion exchange resin, and any combination thereof.

165 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, wherein an effective diameter of the at least one abrasive particle is from about 30 to about 170 nanometers.

166 (currently amended). The composition of any of claims 153 ~~, 154~~ and 155, wherein the at least one abrasive particle comprises aggregated or agglomerated particles.

167 (currently amended). The composition of any of claims 153 ~~, 154~~ and 155, wherein the catalyst comprises a material selected from iron acetate, copper acetate, and any combination thereof.

168 (currently amended). The composition of any of claims 153 ~~, 154~~ and 155, wherein the catalyst is in physical connection with from about 5 to about 80 percent of the surface of the abrasive particle.

169 (currently amended). The composition of any of claims 153 ~~, 154~~ and 155, wherein the catalyst is in physical connection with from abut 25 to about 50 percent of the surface of the abrasive particle.

170 (currently amended). The composition of any of claims 153 ~~, 154~~ and 155, wherein the catalyst is substantially insoluble in the composition.

171 (canceled).

172 (currently amended). The composition of claim ~~any of claims~~ 153 ~~and 154~~, wherein the catalyst and the oxidizing agent are capable of interacting to generate free radicals.

174 (currently amended). The composition of any of claims 153 ~~, 154~~ and 155, wherein the at least one abrasive particle and the catalyst are in physical connection therewith together are in an amount of from about 0.01 to about 10 weight percent relative to the composition.

175 (currently amended). The composition of any of claims 153 ~~, 154~~ and 155, wherein the at least one abrasive particle and the catalyst in physical connection therewith together are in an amount of about 0.5 weight percent relative to the composition.

176 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, the physical connection selected from a group consisting of a formation of at least a particle layer of the catalyst n at least a portion of the abrasive, an absorption of the catalyst on at least a portion of the abrasive, an adsorption of the catalyst on at least a portion of the abrasive, and an adhesion of the catalyst on at least a portion of the abrasive.

177 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, the physical connection sufficient to remain substantially ~~in tact~~ intact during chemical-mechanical polishing.

178 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, the physical connection sufficient such that the catalyst is not free in the composition.

179 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, the physical connection sufficient such that the metal is not free in the composition.

180 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, further comprising at least one free abrasive that is free of a physical connection with catalyst.

181 (previously presented). The composition of claim 180, wherein the free abrasive is in an amount of from about 0.01 to about 10 weight percent relative to the composition.

182 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, further comprising a free catalyst that is free in the composition in an amount sufficient to avoid destabilization of the composition.

183 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, further comprising a free catalyst that is free in the composition in an amount sufficient to avoid degradation of the oxidizing agent.

184 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, further comprising an additive selected from a group consisting of a polish-enhancement agent, a stabilization agent, a surfactant, a dispersion agent, a pH-adjusting agent, and any combination thereof.

185 (previously presented). The composition of claim 184, wherein the additive is present in an amount of from about 0.001 to about 2 weight percent relative to the composition.

186 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, wherein a pH of the composition is from about 2 to about 8.

187 (currently amended). The composition of any of claims 153 ~~,154~~ and 155, the composition sufficient for chemical-mechanical polishing of a substrate surface having a feature thereon comprising a first material selected from a group consisting of aluminum, copper, titanium, tungsten, any alloy thereof, and any combination thereof.

188 (previously presented). The composition of claim 187, the composition sufficient for chemical-mechanical polishing of the substrate surface comprising a second material adjacent the feature, the second material selected from a group consisting of tantalum, tantalum nitride, titanium, titanium nitride, titanium tungsten, tungsten, and any combination thereof.

189 (currently amended). A method of polishing a substrate surface having at least one feature thereon comprising a metal, comprising:

providing the composition of any one of claims 153 ~~,154~~ and 155; and

chemical-mechanical polishing the feature with the composition.

190 (previously presented). The method of claim 189, wherein the metal of the feature is selected from a group consisting of aluminum, copper, titanium, tungsten, any alloy thereof, and any combination thereof.

191 (previously presented). The method of claim 189, wherein the feature is adjacent a material selected from a group consisting of tantalum, tantalum nitride, titanium, titanium nitride, titanium tungsten, tungsten, and any combination thereof.

192 (previously presented). The method of claim 189, wherein the chemical-mechanical polishing comprises applying a pressure of from about 1 to about 6 pounds per square inch to the feature.

193 (previously presented). The method of claim 189, said method sufficient to provide the substrate surface with about zero to about 12 percent within-wafer nonuniformity.

194 (previously presented). A substrate produced by the method of claim 189, the substrate comprising the substrate surface, the metal of the feature being selected from a group consisting of aluminum, copper, titanium, tungsten, any alloy thereof, and any combination thereof.

195 (previously presented). The substrate of claim 194, wherein the feature is adjacent a material selected from a group consisting of tantalum, tantalum nitride, titanium, titanium nitride, titanium tungsten, tungsten, and any combination thereof.

196 (previously presented). The substrate of claim 194, the substrate surface having from about zero to about 12 percent within-wafer nonuniformity.

197 (New). The composition of claim 98, wherein the at least one abrasive particle comprises silica produced by a process selected from a group consisting of a hydrothermal process, a plasma process, a fuming process, and any combination thereof.

198 (New). The composition of claim 107, wherein the at least one abrasive particle is alumina.

199 (New). The composition of claim 107, wherein the at least one abrasive particle is titania.

200 (New). A method of polishing a substrate surface having at least one feature thereon comprising a metal, comprising:

providing the composition of claim 142; and

chemical-mechanical polishing the feature with the composition.

201 (New). A composition for chemical-mechanical polishing, comprising:

at least one oxidizing agent;

at least one abrasive particle; and

a catalyst comprising a source of an ion of a metal, wherein the metal is selected from a group consisting of metals in Group 1(b) and Group 8, or any combination thereof, there being a physical connection between the catalyst and at least a portion of the abrasive particles.

202 (New) A method of polishing a substrate surface having at least one feature thereon comprising a metal, comprising:

providing the composition of claim 201; and

chemical-mechanical polishing the feature with the composition.

203 (New). A composition for chemical-mechanical polishing, comprising:

at least one oxidizing agent;

at least one abrasive particle; and

a catalyst comprising a source of an ion of a metal, wherein the source is in a form selected from a group consisting of an acetate, a nitrate, a halide, a perchlorate, and any combination thereof, wherein the metal is other than a metal of Group 4(b), Group 5(b), or Group 6(b), there being a physical connection between the catalyst and at least a portion of the abrasive particle.